Apple II
Technical Notes

Apple IIGS
#40:   VBL Signal

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This Technical Note discusses reading the VBL signal to accomplish smooth animation.
Changes since November 1988: Noted that vertical blanking does not begin when you might expect on the Apple IIGS and removed references to the Apple IIc.

Applications can accomplish smooth animation on the Apple IIGS and Apple IIe by changing the data on the screen during the time the system is tracing the unusable area of the display. This time is called "vertical blanking" or "VBL" in this Note. You can determine the state of the VBL signal by reading location $C019.

On the Apple IIGS, the $C019 sense of the VBL signal differs from the IIe. On the IIGS, the screen is blanked when the most significant bit of $C019 is **high** (greater than 127 or $7F), while on the IIe, the screen is blanked when the bit is **low** (less than 128 or $80).

A VBL interrupt also is available on Apple II systems via the Apple IIGS Miscellaneous Tool Set or mouse firmware, the Apple IIe mouse card, and the Apple IIc mouse firmware.

On the Apple IIGS, vertical blanking begins at scan line 192 regardless of the display mode. When the Super Hi-Res display is visible, vertical blanking begins eight scan lines before the bottom of the display area. If the VBL interrupt is enabled, it triggers at scan line 192.

Further Reference

- Apple IIGS Technical Note #39, Mega II Video Counters